**AFRICA RISING: WORKSHOP ON DATA MANAGEMENT AND DATA ANALYSIS.** **SIKASSO, MALI JANUARY 18- 22, 2016**



1. **INTRODUCTION**

Africa Rising in his effort to encourage scientists associated with its project to analysis their data and publish, organized a five-day workshop for the earlier-career scientist involved in the Africa Rising projects in Mali.

After the training session, the participants should be able to:

* Identify various types of scientific data and their collection procedures (experimentation and survey).
* Design an experiment and to understand the reasons why a given experimental design is preferred to another one.
* Identify suspect values in a data set (outliers).
* Understand appropriate statistical analysis and when to apply them.
* Extract from a statistical analysis output main components to be included in a scientific report.

1. **TERMS OF REFERENCE**

The Terms of reference are to conduct a five-day training course on experimental design and data analysis for early-career scientists associated with the Africa RISING project in Sikasso, Mali.

1. **VENUE OF THE TRAINING:**

The training took place in Sikasso. Among the 19 participants, 17 participants were accommodated at Hotel du Cinquantenaire. Mr Marc Traore, ICRISAT Administrative Assistant welcomed the participants and wished them a productive training session. Each participant brought his own laptop. The statistical software GENSTAT DISCOVERY EDITION (free version) was installed on each participant laptop. All the practical sessions on data analysis were carried out using this software.

1. **PROGRAM**

The emphasis was put more on the understanding of concepts than on their theoretical aspects.

The time table of the training session follows.

**Monday 18/01/2016**

08:00 - 08:30 Registration of participants – Opening Ceremony

08:30 – 10:00 Course description and presentation – Participants’ expectations of this course

10:00 – 10:20 Break

10:20 – 12:30 Statistical aspects of experimentation – Concepts of hypothesis testing

12:30 – 14:00 Lunch break

14:00 – 16:00 Data type and scale of measurements – Tabulation & graphs

16:00 – 16:20 Break

16:20 – 18:00 Hands on GENSTAT DISCOVERY EDITION

**Tuesday 19/01/2016**

08:00 – 10:00 Sampling Methods

10:00 – 10:20 Break

10:20 – 12:30 Sampling methods

12:30 – 14:00 Lunch break

14:00 – 17:00 Hands on Sampling methods

**Wednesday 20/01/2016**

08:00 – 10:00 Experimental designs: Principles

10:00 – 10:20 Break

10:20 – 12:30 Experimental designs: practical

12:30 – 14:00 Lunch break

14:00 – 17:00 Analysis of variance and the method of contrasts/ Practical session on Analysis of variance/ output interpretation

**Thursday 21/01/2016**

08:00 – 10:00 Regression Analysis (Simple and multiple)

10:00 – 10:20 Break

10:20 – 12:30 Practical session on regression analysis / output interpretation

12:30 – 14:00 Lunch break

14:00 – 17:00 Contingency data analysis & Introduction to non-parametric methods / Practical sessions

**Friday 22/01/2016**

08:00 – 10:00 Multivariate analysis

10:00 – 10:20 Break

10:20 – 13:00 Multivariate analysis/ Results presentation/ Course evaluation

13:00 – 14/:00 Lunch break

**Free Afternoon – Visit of some touristic sites of Sikasso**

**Saturday 23/02/2016:** Return to Bamako

1. **DOCUMENTS DISTRIBUTED**

The following learning material mostly in French were given in soft copies to participants. These include all the power point presentations and notes. Data sets for practical sessions were given to participants. Participants also used their own data during the practical sessions.

* Data type and scale of measurements
* Sampling methods
* Statistical aspects of Experimentation
* Statistical concepts
* Sampling methods
* Regressions Analysis: Relationship between variables
* Analysis of contingency tables
* Non parametrics Methods
* Multivariate analysis
* Dagnelie, P. (2003) Principes d’expérimention: planification des expériences et analyse de leurs résultats. Edition électronique. <http://www.dagnelie.be> , 397 pages
* Alain Bacccini & Philippe Besse – Data Mining I- Exploration Statistique
* Box & Jenkins – Time Series analysis, forecasting & control ( In English)
* Richard A Johnson & Dean W. Wichern - Applied multivariate Statistical Analysis ( in English)
* Presenting statistical results

1. **COMMENTS FROM THE RESOURCE PERSON**

Participants were enthusiastic and actively participated in the training course. It was a participatory and interactive session. They raised many questions in relation to their own interests with respect to data handling, data analysis and interpretation. They contributed in providing relevant examples. Their own data sets were used to for the practical session.

Practical sessions conducted in groups may have helped the understanding of concepts and their applications. They have raised their awareness on what to do or not to do when designing a survey or an experiment.

Participants interacted well with the resource person.

Based on the motivation, the enthusiasm and the commitment of the participants during the training session, I anticipate that most of them will be able to conduct a survey or an experimentation taking into accounts the requirements and be able to produce a comprehensive report based on a valid data analysis.

Before the start of the training session, the participants mentioned the following expectations from the training course:

* Deepen their knowledge of GenStat
* To know how to analyze data
* To know which appropriate statistical methods to apply
* To know how to interpret statistical output
* To know how to develop a template for data entry

I believe the main objective of the training has been reached. However the participants should on a regular basis practice the topics covered. After each trial they should be asked to produce a first draft on data analysis.

1. **GENERAL EVALUATION OF THE COURSE BY 16 PARTICIPANTS**

Participants were asked at the end of the training session to give an evaluation of the training course (see in appendix the evaluation form). From the participants’ evaluation of the course the following points are to be noted.

All the 16 participants who completed the evaluation form, are globally satisfied with the training session. All of them confirm that their expectations from this course have been met and that they have acquired knowledge and practical tools that will allow them to effectively perform their duties.

94% of the participants confirmed the training has better prepared them to be able to identify different scientific data type and the appropriate methods of data collection and analysis. 81% of the participants said that they will be able to identify procedures for data validation and select appropriate methods of data analysis.13% of the participants said that they will not be able to identify procedures for data validation and select appropriate methods of data analysis.

81% of the participants said that they can present results from statistical analysis in scientific reports while 13% said they cannot.

**COMMENTS & SUGGESTIONS FROM PARTICIPANTS (VERBATIM)**

* More time required and repeat of a similar training in order to master the subject
* No comment
* Thanks to the resource person for his availability and courtesy. Consider having a longer training session
* No comment
* We need more time for such training – We may consider online training with the resource person to maintain contact
* Good appreciation to the resource person. The subjects were interesting
* No comment
* No comment
* This type of training should be regularly organized in order to equip the participants with the statistical knowledge for interpretation of results output.
* More of this type of training is needed with more time devoted. Introduction of other statistical software is needed.
* We should concentrate on tables and on interpretation of results which is the key for data analysis.
* The training session was useful. It allowed me to discover Genstat and to know methods of analyzing agronomic data.
* Since it is my first time to discover this type of method. It is not obvious if I can carry a data validation on my own. Time may be required to master results presentation in scientific reports.
* The training session was useful as we do use a lot sampling methods. The resource person was capable and motivated.
* I have been well equipped for statistical data analysis.
* The training session went well. Many participants did not know the statistical but now they all know it. My sincere thanks to the resource person for his availability and for standing throughout the training session to attend to the needs of the participants.

1. **LIST OF PARTICIPANTS**

18 participants took part in the training including the administrative assistant and the accountant. Their contacts and that of the resource person follow.

1. Name: DEMBELE OUSMANE

Institution: ONG AMEDD

Title: Head of Department

Specialisation: Agronomy

Email: Ousmeml@yahoo.fr

Telephone: +22376147150 / 68188779

1. Name: GUEDESSOU CEDRICK

Institution : ICRISAT

Title: Research Assistant

Specialisation: Irrigation specialist Engineer (Hydraulics)

Email: c.guedessou@icrisatml.org/cedrick.victoir@gmail.com

Telephone: +22360202838

1. Name: DIARRA HONAFING

Institution : AVRDC

Title: Research Assistant – Nutritionist (Engineer)

Specilisation: Nutrition

Email: honafing.diarra@worldveg.org

Telephone: +22363653164

1. Name: TRAORE ALPHA SIDY

Institution : AVRDC

Title: Research Associate

Specialisation: Agronomy

Email: alphatraore2006@yahoo.fr

Telephone: +22375088944

1. Name: CISSE ALPHA ACHEICK

Institution : AVRDC

Title: Stagiaire

Specialisation: Computing

Email: Alphaacheick@gmail.com

Telephone: +22383132723 / 79134648

1. Name: DEKORO DEMBELE

Institution : ICRISAT

Title: Assistant de recherche

Specialisation: Agronomy

Email: d.dembele@icrisatml.org

Telephone: +22376125523 / 69385470

1. Name: MAMADOU CAMARA

Institution: AMASSA AFRIQUE VERTE

Title: Advisor

Specialisation: Agronomy

Email: macamcamara@yahoo.fr

Telephone: +22376215443

1. Name: FATOUMATA TATA TRAORE

Institution: ICRAF

Title: Research Assistant (Engineer of water & forestry)

Specialisation: Agro-Forestery

Email: F.tata@cgiar.org

Telephone: +22376187369

1. Name: ADAMA DIAKITE

Institution: ICRAF

Title: Junior Scientist/ Socioenomist

Specialisation : Sociologie et Economie rurales

Email: a.diakite@cgiar.org/diakiteada@gmail.com

Telephone: +22370833965

1. Name: Mahamadou Moctar Dicko

Institution: ICRISAT

Title: Scientific Officer

Specialisation: Socio-Environnementalist

Email: dickomahamadou373@gmail.com

Telephone: +22376364666 / 96869090

1. Name: GAOUSSOU DIARRA

Institution: ONG - CAAD

Title: Coordinator

Specialisation: Agronomy

Email: Caadmali@yahoo.fr

Telephone: +22376483654 / 21762404

1. Name: OUATTARA CHEICK OUMAR

Institution: GRAADECOM

Title: Coordinator

Specialisation: Agronomy

Email: Cheickoumarouattara58@yahoo.com

Telephone: +22375294497

1. Name: BAYOKO AROUNA

Institution: ONG AMEDD

Title: Technical advisor

Specialisation : Geography/Landscape

Email: bayokoarouna@yahoo.fr/arouna.bayoko@ameddmali.org

Telephone: +22366315033 / 76315033

1. Name: BOCAR DIALLO

Institution: IER

Title: Research Assistant

Specialisation: Agronomy

Email : bocadiall@yahoo.fr

Telephone: +22366853312

1. Name: SAMAKE OUMAR

Institution: IER

Title: Research Assistant

Specialisation: Agronomy

Email: Oumarsamake2001@yahoo.fr

Telephone: +22366957744/76639647/76957744

1. Name: KARAMOKO TRAORE

Institution: ICRISAT

Title: Assistant de recherche

Specialisation : Agronome - Vulgarisation Agricole

###### Email: k.traore@icrisatml.org/tkaramoko@yahoo.com

Telephone: +22379161883/ 98558820

1. Name: MARC TRAORE

Institution: ICRISAT

Title: Administrative Assistant

Specialisation: Administration & Logistics

Email: m.traore@icrisatml.org/marctrr@gmail.com

Telephone: +22376303234 / 65783299

1. Name: HAIDARA OUSMANE

Institution: ICRISAT

TITLE: Financial Officer

Specialisation: Accounting

Email: housmanesidy30@yahoo.fr

Telephone: +22366868888 / 74092375

**RESOURCE PERSON:**

Mr. Mamadou Lamine Diedhiou

Biometrician/Statistician

Dean Business School

Wisconsin International University College

P. O Box LG 751, Legon, Accra, Ghana

EMAIL: [mldiedhiou@gmail.com](mailto:mldiedhiou@gmail.com)

TEL: +233547060414

APPENDIX

**AFRICA RISING: WORSHOP ON DATA MANAGEMENT AND ANALYSIS**

**Sikasso, Mali, 18 – 22, January 2016**

**COURSE EVALUATION BY PARTICIPANTS**

1. **GENERAL OBSERVATIONS**
2. Globally, are you satisfied with the training? **YES NO**
3. Are your expectations met? **YES NO**
4. Based on this training, have you acquired knowledge and practical tools to effectively perform your work?   **YES NO**
5. Has the resource person covered all the topics indicated in the program? **YES NO**
6. Were the ideas and the methods presented relevant? **YES NO**
7. Were the ideas and the methods presented relevant with respect to the objectives of the course?

**YES NO**

1. Is there coherence between .ideas? **YES NO**
2. Exchange between the resource person and the participants were useful. **YES NO**
3. Exchange between participants were useful.  **YES NO**
4. The size of the group was appropriate. . **YES NO**
5. Which new practical tools and knowledge have you acquired that will allow you to effectively perform your work?
6. **PROGRAM**
7. Which components of the program were not too detailed?
8. Which components of the program were too detailed?
9. Which components of the program were adequately covered?
10. Which components of the training have you found more useful?

**Based on this training, are you better prepared to:**

1. Identify the different scientific data types and the appropriate methods of data collection and analysis? **YES NO**
2. Identify procedures for data validation and select appropriate methods of data analysis?  **YES NO**
3. Present results from statistical analysis in scientific reports?

**YES NO**

1. **METHODOLOGY**

**Among the following items:**

Documents made available, practical sessions, diversified examples, daily length of the training session, course delivery method, the balance between theory and practice, punctuality of the resource person, interaction between the resource person and the participants, the presentation of theoretical aspects, the length of the training session, the in-balance in the presentations of the different subjects, availability of the resource person.

1. **Which ones did you like the most?**
2. **Which ones you did not like?**
3. **Your suggestions in order to improve the pedagogical method?**
4. **Your comments and observations.**